

Industrial Hemp Regulations Summary

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Quick Bio:

- Associate Professor; Georgia Tech faculty since 2010
 - B.A. - Economics - University of Pennsylvania
 - Ph.D. - Public Policy – Indiana University
- Director – Sustainable Energy & Environmental Management Program
- Research interests:
 - Energy, Environment, & Innovation
 - Emergent Technologies & Policies
 - State Energy & Environmental Policies
- Lead Author for "Waste Management & Recycling" - Georgia Drawdown

ORGANIZATIONS AND THE NATURAL ENVIRONMENT

Ecolabels, Innovation, and Green Market Transformation

Learning to LEED



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Hemp / Cannabis Industry & Waste Considerations

- Agricultural Production
 - Regulated at Federal / State level
 - Destruction of "non-compliant" crops
 - Other wastes
- Lab testing
 - Plastic wastes
- Cannabinoid extraction
 - Hazardous wastes
- Medical / Retail Consumer Sales
 - Plastics; Vape Pens; etc.
 - Expired / excess product

Agricultural Production

- Industrial hemp and related policies
- Also: medical / recreational for CBD / THC

National Regulatory Framework for Hemp

- Industrial Hemp is Defined as Hemp Products with <0.3% Delta 9 THC
- 2018 Farm Bill Requires USDA to create national regulatory framework for hemp production
- Jan 19, 2021 – Final Rule, Effective March 2021
- Establishes minimum baseline regulations for hemp production
- <https://www.federalregister.gov/documents/2021/01/19/2021-00967/establishment-of-a-domestic-hemp-production-program#print>
- 20 States have approved USDA plan; other states can follow USDA plan

2018 Farm Bill Impacts

- 20 States & 9 Tribes have approved hemp production plans (including Georgia)
- By 2020:
- 4,192 licensed producers
- 6,166 Acres planted
- 231 disposals for “non-compliant crops”
- 730 acres disposed

Licensing Requirements

- USDA Licenses Hemp Producers
 - <https://www.ams.usda.gov/rules-regulations/hemp/information-producers>.
- Includes criminal background checks for “key participants”
- Must report crop acreage
- Sampling must occur in DEA registered laboratories
- States are permitted to develop “performance-based alternatives”
 - Use of certain seed varieties
 - Consistent compliance with THC levels
 - Whether research is occurring and if there is government funding
 - And “similar factors”

Regulating THC Content

- USDA pre-approves seed varieties with low THC content
- States are required to sample plants such that no more than 1% of plants has Delta 9 THC content $>0.3\%$ with 95% confidence interval
- Sampling must be within 30 days of harvest at registered testing labs
 - (Georgia = 15 days)
- Testing laboratories must be registered with Drug Enforcement Agency (DEA)
- $>1.0\%$ THC represents “negligence” and a farmer is subject to revoking or suspending license (this was increased from 0.5%)
 - Farmers with negligent violations are NOT subject to criminal enforcement

Disposal / remediation of “non-compliant” plants

- If the sample contains >0.3% THC with 95% confidence, then it is subject to “disposal and removal”
- Plants over 0.3% THC are considered Schedule 1 controlled substances must be collected and destroyed. Options include:
 - Collection by DEA registered reverse distributor
 - OR: Authorized Federal, State, Tribal, or local law enforcement officers
 - OR: **On-farm disposal**: Options include plowing; composting; tilling; burning; or burial
 - “common on-farm practices”
 - *Goal to minimize resource impact to States and law enforcement & DEA involvement*
 - <https://www.ams.usda.gov/rules-regulations/hemp/enforcement>
- Remediation is an option: non-compliant parts of plants are disposed, salvaging compliant parts of plants

State and Tribal Plan Requirements for Disposal

- Procedures to verify disposal
 - Either in-person verification or
 - Requirements that producers provide pictures / videos / or other proof of disposal
- Hemp with greater than 0.3% must be disposed or remediated.
- A separate set of remediation procedures and rules exist:
 - Flowers can be disposed of and the rest of the plant material can be salvaged
 - Entire plant can be blended into biomass plant material

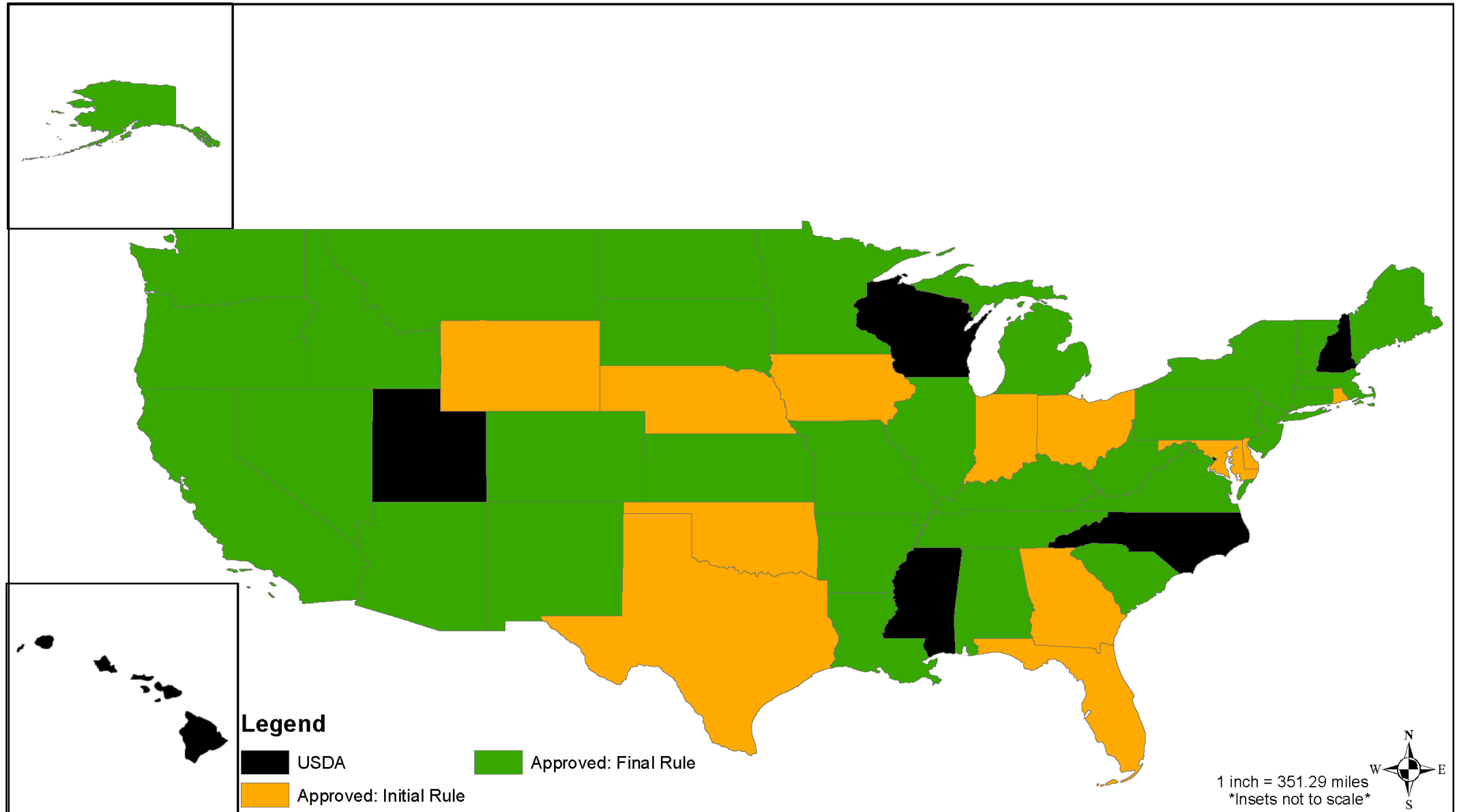
Georgia Hemp Production Plan Disposal Rules

- Georgia Rule 40-32-2-.06 entitled “Disposal of Non-Compliant Cannabis” provides that:
 - Cannabis exceeding the acceptable hemp THC level constitutes marijuana, a schedule I controlled substance under Georgia law and federal law. Marijuana must be disposed of in accordance with the CSA and DEA regulations found at 21 CFR 1317.15 by a reverse distributor.
 - The Licensee must immediately notify the Department via email any time analytical testing determines that a lot has exceeded the acceptable hemp THC level.
 - Upon notice and confirmation that a lot has exceeded the acceptable hemp THC level, the Department will issue an Order of Disposal requiring the entire crop and all plant material to be disposed within a reasonable time to be determined by the Department.
 - The Licensee will be responsible for arranging disposal through a reverse distributor.
 - Cannabis subject to disposal must not be removed from the Grow Site or from any other area where such cannabis is being handled or stored.
 - Within 30 days of the date of completion of disposal, the Licensee must submit a “Disposal Report” form to the Department, which must contain the following information:
 - Name and address of the Licensee;
 - Hemp Grower License number;
 - Geospatial location, including location type, or other valid land descriptor, for the production area subject to disposal;

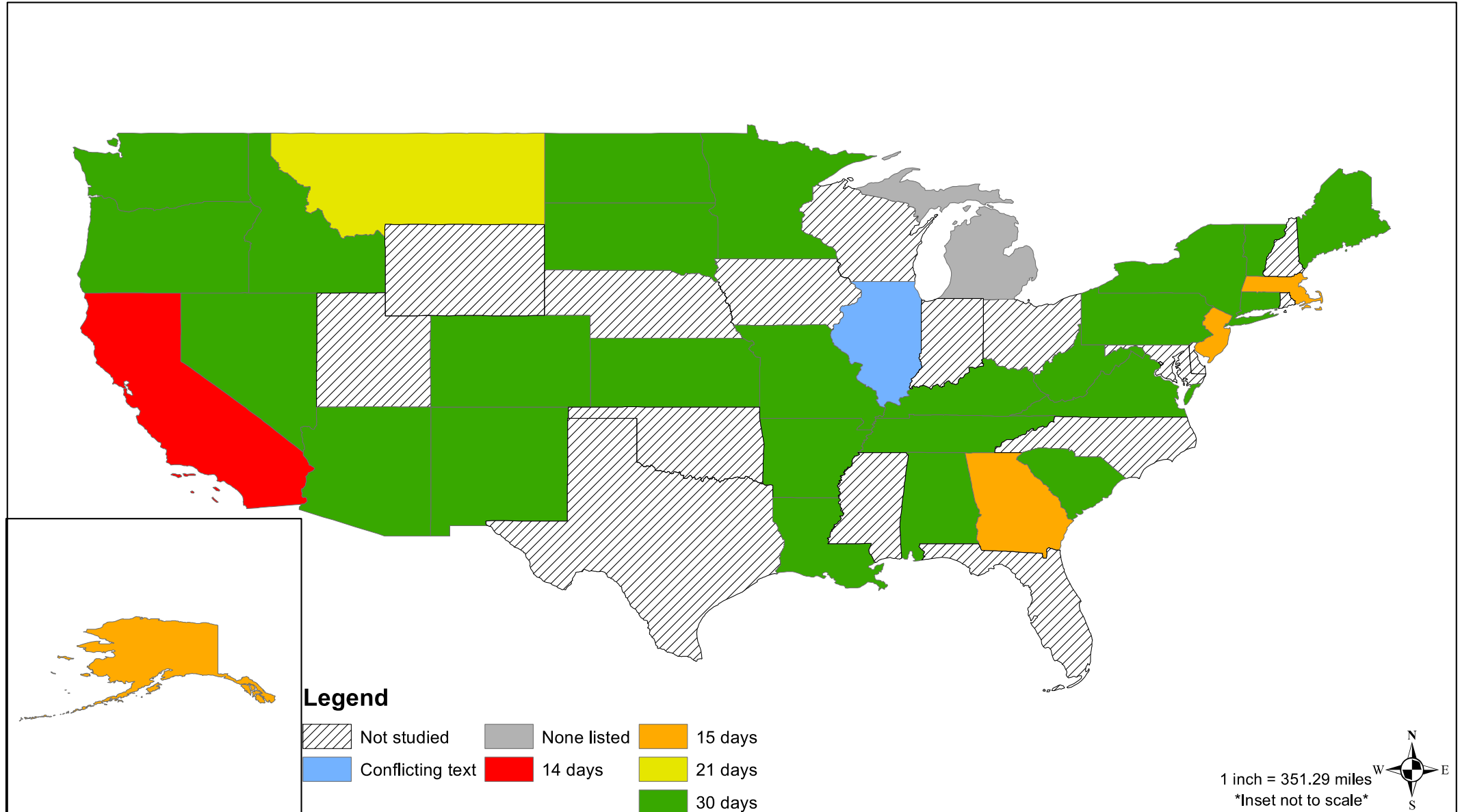
Key differences between federal regulations and GA regulations

- Federal regulations allow testing within 30 days of harvest; GA regulations require testing 15 days of harvest
- Federal regulations allow on-site disposal or remediation
 - Specifically designed to reduce DEA involvement and reduce resource commitment by states / local officials
- Georgia regulations require destruction by “reverse distributor”

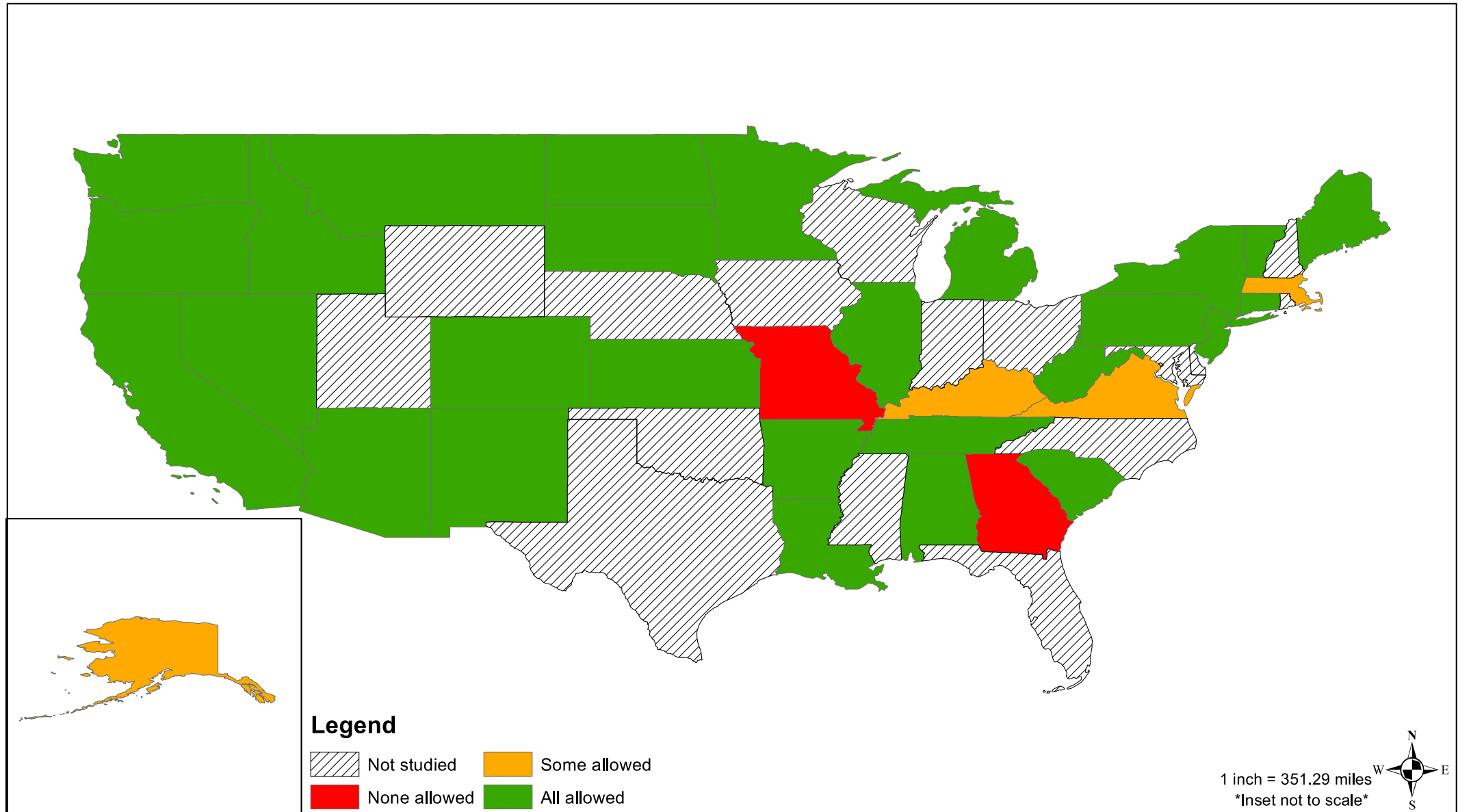
State Hemp Producer Plan Status



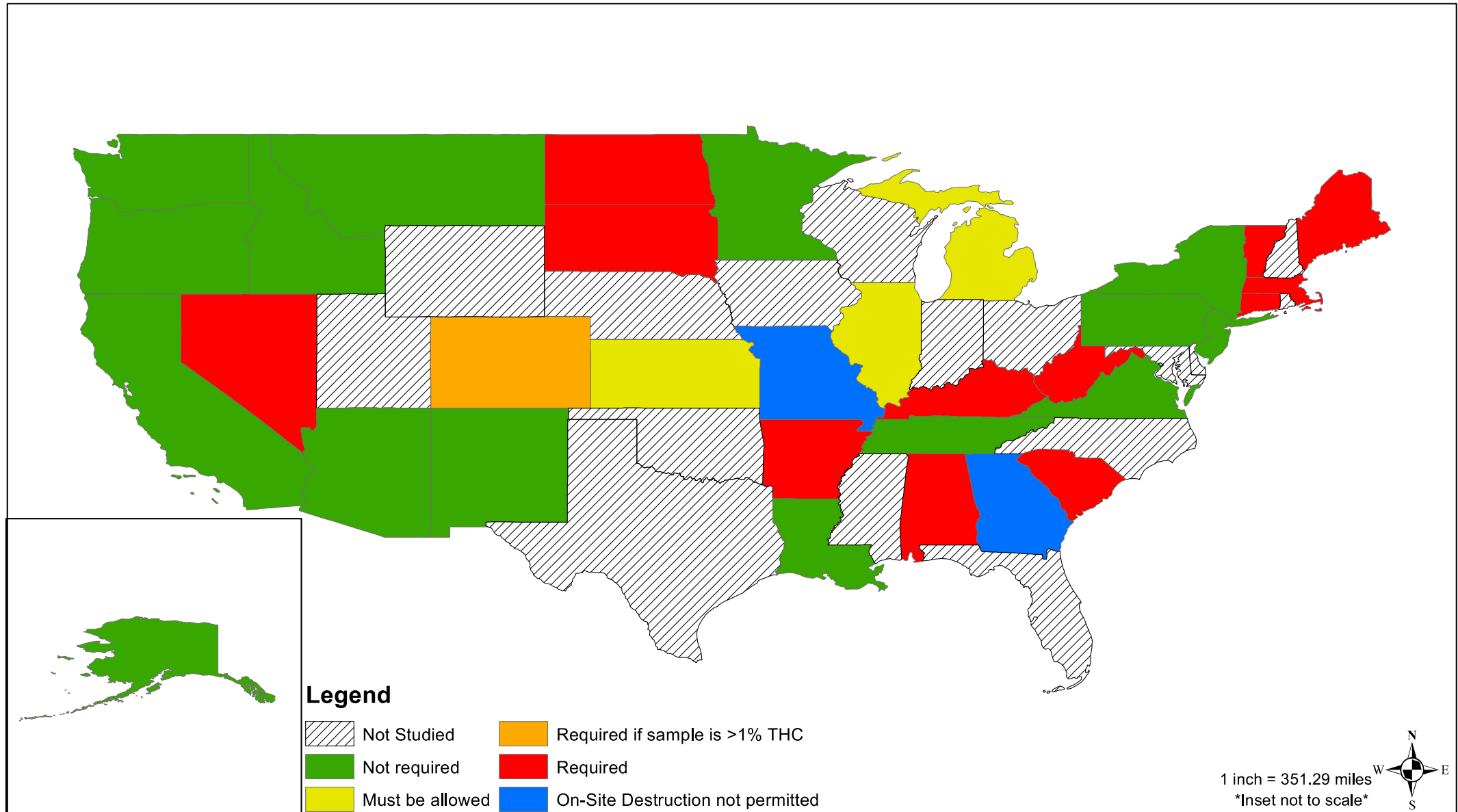
States' Sampling-to-Harvest Window



USDA On-Site Destruction Methods



State Policy on Department Witnessing On-Site Destruction



Interesting policies from other states

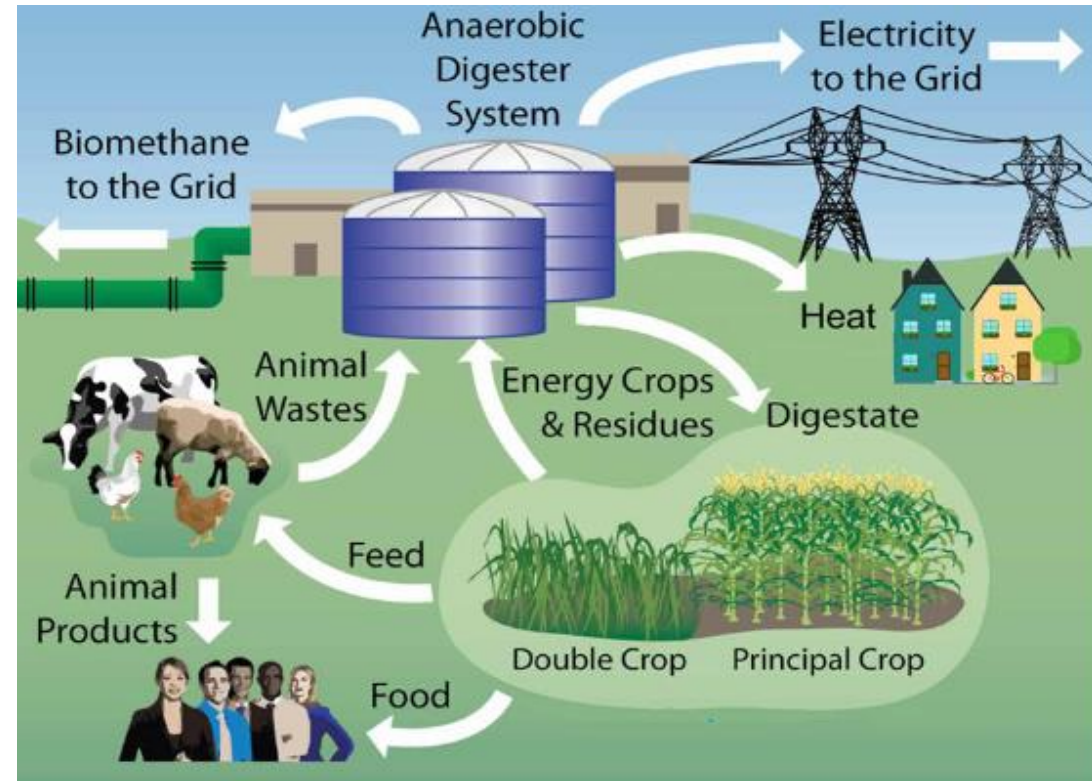
- Harvest Notice
 - Nevada – Encourages at least 45 days ahead of anticipated harvest, timely notices receive preferential treatment for sampling scheduling.
- Dept Personnel Present at Destruction
 - Colorado – Department personnel are not required for destruction of marijuana between 0.3% and 1%, photo/video evidence suffice
 - Montana – Requires photo/video evidence along with sworn witness statement from independent third party

Common Disposal Methods

- 1. Anaerobic Digestion (on farm)
- 2. Composting (on farm or off-farm)
- 3. Incineration
- 4. Landfilling

Anaerobic Digestion (AD)

- Digester sizes range from 50-2800 kW, the larger the AD unit the “less expensive to operate per unit of energy produced.”
- Further increases in CO₂e price are required before small (250 kW) ADs to medium (500 kW) AD digesters become competitive.



Courtesy of: <https://www.energy.ca.gov/data-reports/california-power-generation-and-power-sources/biomass/anaerobic-digestion>

Composting

Composting focuses on emission avoidance and co-benefits include:

- Carbon sequestration, creating carbon sinks
- Reduction in fertilizer and herbicide application
- Reduction in water and electricity consumption



Courtesy of: Biocycle



Incineration or Waste-to-Fuel (WtF)

- The carbon footprint of non-hazardous MSW incineration is $-0.179 \text{ t CO}_2 \text{ eq./t MSW}$ while that handled by landfilling is $0.395 \text{ t CO}_2 \text{ eq./t MSW}$.
- Incineration, albeit a substantial contributor of GHG, the method emits less carbon than landfilling.

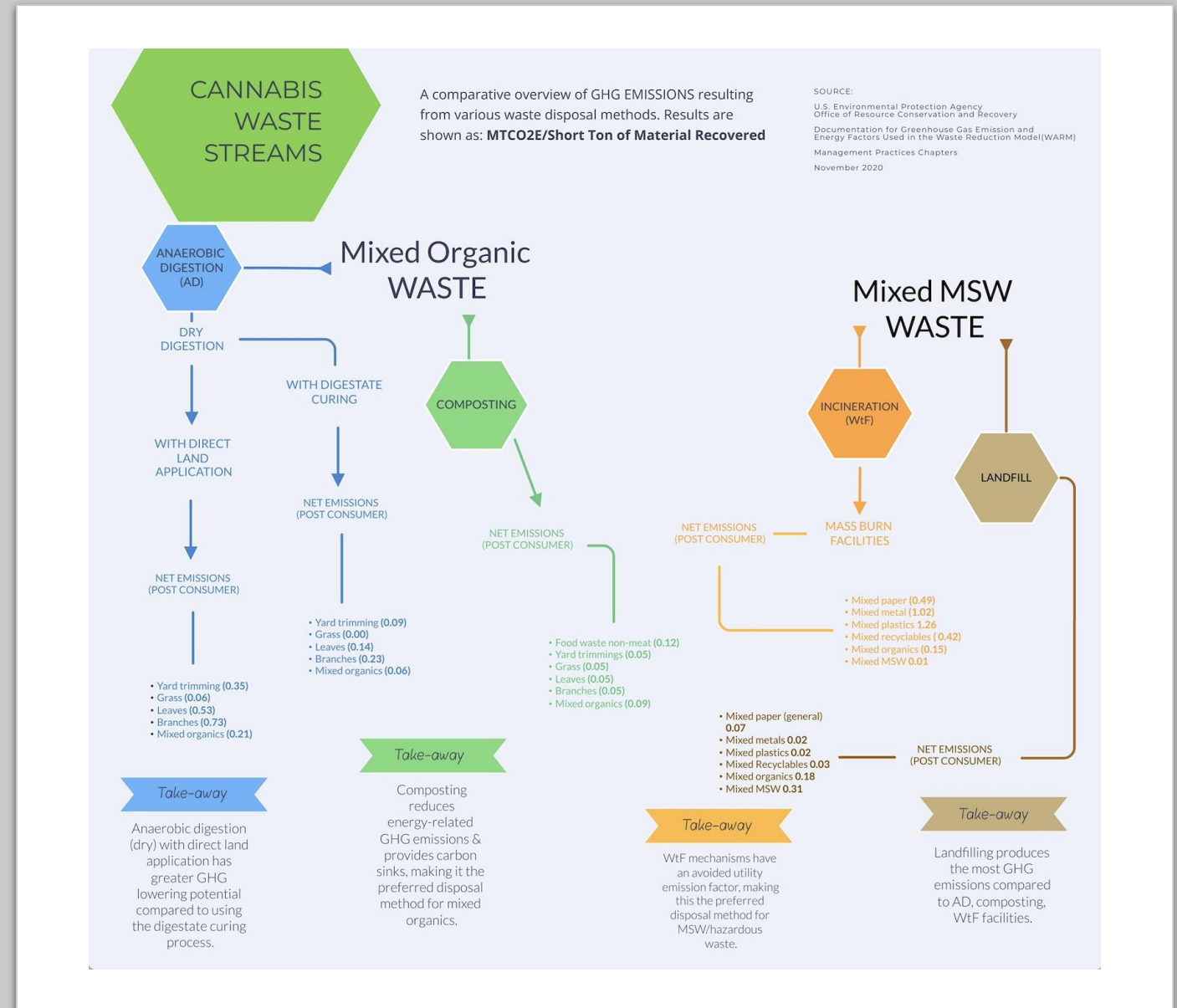
Photo provided by: WIRED

Landfilling for Cannabis Waste

- Landfill waste – responsible for about 11% of global methane emissions – is expected to increase about 70% by 2050 as the global population continues to climb, according to the [World Bank](#).
- In the US, most landfill methane is flared

Recommended Disposal:

- Non-hazardous – organic
 - Composting (on-site, off-site)
 - Anaerobic digester (dry)
- Non-hazardous – MSW
 - Incinerator
 - Landfill
- Hazardous
 - Registered hazardous waste transporter-- shipping to a hazardous waste treatment, storage, and disposal facility. (Usually involves incineration).



Other waste considerations

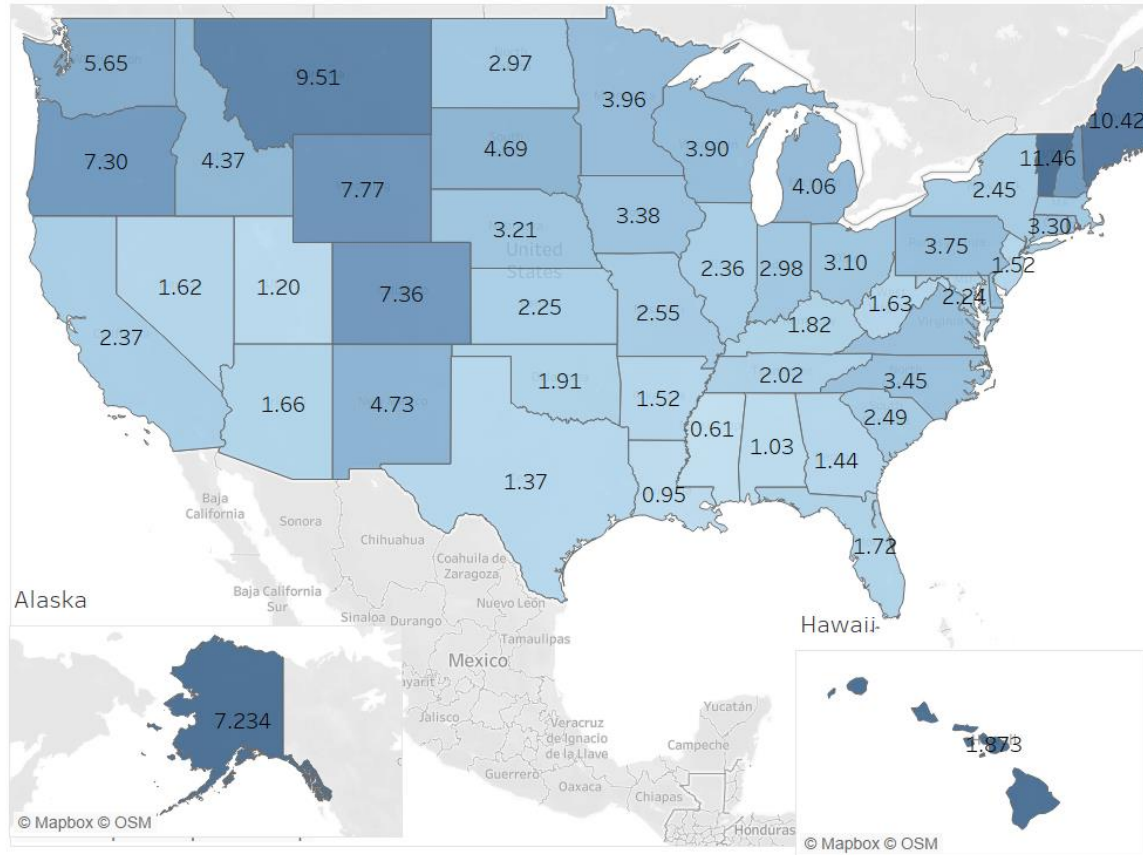
- Hazardous wastes (Acetone; Ethanol; Butane; Pesticides; Fertilizers; others)
- Lighting equipment (fluorescents; LEDs; ballasts)

Some policy observations re: emergent industry

- Regulations on emergent technologies / industries are economically burdensome
 - Greater likelihood of involvement of DEA => less entrepreneurship, investment, & innovation
 - Greater losses of "non-compliant crops" => less entrepreneurship, investment, & innovation
 - Greater flexibility to harvest => less additional testing fees and uncertainty (weather, equipment failure, etc.)
 - Increasing costs of testing & disposal means Georgia is less competitive
 - Increasing costs of testing & disposal increases likelihood of illegal policy avoidance
- Overall, environmental impact of cannabis waste is likely small, but can be minimized using standard farming practices
- Evidence from craft beer industry
 - Burdensome regulations (e.g. self distribution restrictions; retail sales restrictions; ABV limits) likely hampered Georgia's development of robust craft beer industry
 - Less regulated states (North Carolina; Oregon; Colorado; Michigan; Indiana; California; Vermont; Alaska) developed much more robust brewing sectors faster
 - Georgia is playing catch-up

Evidence from Brewing Industry

Breweries Per Capita 2021 (100K)



US Craft Breweries 2021

